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Worldwide Report

NUCLEAR DEVELOPMENT AND PROLIFERATION

(FOUO 1/81)

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WORLDWIDE AFFAIRS

ITALY-INDONESIA NUCLEAR COOPERATION AGREEMENT SIGNED

Rome ATOMO E INDUSTRIA in English 15 Oct 80 p 8

[Text]

An Italian Delegation, headed by the President of CNEN, Professor Umberto Colombo, with the Director General of NIRA-Nucleare Italiana Reattori Avanzati (Finmeccanica Group), Dr. Ing. Bruno Musso, visited from 8 to 13 October Djakarta. Professor Colombo and Professor A. Baiquni, Director General of BATAN (Badan Tenaga Atom Nasional), the Indonesian Atomic Agency, signed during the visit, with the Ambassador of Italy Elio Pascarelli attending, the first implementation program of the Agreement between Italy and Indonesia on the peaceful uses of atomic energy, signed in Djakarta on 17 March 1980 by the Ministers of Scientific and Technological Research of the two countries (Aei, March 25, 1980).

The Italian Delegation had meetings with the Ministers of Mines and Energy, of Scientific Research and of Economic Planning. During the meetings, the Indonesian energy program was examined under the light of the scientific and technological co-operation between Indonesia and Italy now in progress, which is also expanding to the industrial field. As a matter of fact, NIRA has just completed its well-known feasibility study for the first Indonesian nuclear power plant (which could be a 660 MWe CANDU) and is competing for important supplies, under the Protocol of Agreement announced on December 21, 1979 (Aei, January 15, 1980), such as the Laboratories for the Research Centre to be built at Serpong, on the island of Java.

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USSR

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DESIGNING NUCLEAR REACTOR BUILDINGS

Moscow ZDANIYA ISSLEDOVATEL'SKIKH REAKTOROV (Buildings for Research Reactors) in Russian 1978 p 2, 154-155

[Annotation and table of contents from book by V.B. Dubrovskiy, A.S. Zinenko, A.A. Levenshteyn, D.A. Metan'yev and A.Ya. Yakovlev, Izdatel'stvo "Nauka", 155 pages]

[Excerpts] The work is devoted to questions of designing the buildings and radiation shielding for nuclear reactors for research. Questions of selection of a sector for construction of the buildings and reactor complexes, designing a master plan, territorial zoning, building lay-out, selection of materials and design decisions for the buildings and shielding and finishing the rooms are examined.

The book is of interest to scientists and engineers working in the area of designing, construction and operation of buildings for nuclear reactors for research, as well as to students specializing in this area. 30 tables, 85 illus., biblio. with 232 titles.

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FRANCE

FUTURE OF SUPER-PHENIX BREEDER REACTORS

Paris LE NOUVEL OBSERVATEUR in French 6 Oct 80 pp 58-59

[Article by Michel Bosquet]

[Text] France's only weapon to insure its energy independence? or a dangerous, costly, and useless technique? for the first time, a public debate about breeder reactors has taken place. Michel Bosquet has carried out a behind-the-scenes investigation.

Those in the know have been aware of it for almost a year: a conflict between Electricite de France and the Commissariat a l'Energie Atomique as well as within the EDF and within the CEA is brewing concerned with the future of the French nuclear program. The object of the conflict is the breeder reactors loaded with 5 tons of plutonium which, while operating, generate more nuclear fuel than they consume. The question to be resolved is: should France launch now into an industrial breeder reactor program which would, starting in 1985, add 10 to 20 additional billions to the 40 billions francs which the traditional nuclear program already costs?

It is because decision makers are divided on this question that for the first time, for a whole week until last Monday, the beginnings of a debate took place on Antenne 2 and Europe 1 TV stations. This turned out to be a very lopsided debate, one against three, involving the spokesmen of the four main political parties which, with the exception of the socialist party, are in favor of the immediate launching of the breeder reactor program. Nevertheless, for the first time, opponents of the "plutonium society" have been able to express themselves clearly and, through Socialist Party spokesman Paul Quiles, raise some of the questions which explain the hesitations and the doubts which can be guessed to exist behind the scenes among those in power.

Plutonium and Uranium

These doubts and hesitations among the decision makers were, of course, never admitted in the course of the debate. The people should not be allowed to imagine that the disagreements between technocrats could open a breech in their decision-making monopoly. This is why the official representatives of the EDF, the CEA, and the political parties of the majority (joined on this subject by the Communist Party) all claim, along with the government: "breeder reactors are indispensable and even unavoidable." The minister of industry and the representatives of the PCF even see

in the breeder reactors an "ecological imperative": do they not consume the abominable plutonium produced in traditional reactors and which has to be prevented from spoiling the face of the earth? Do they not take advantage of the depleted uranium produced in traditional reactors and which would otherwise be wasted? And finally, aren't they alone capable of insuring for France "two centuries of energy independence" by multiplying by 50 and maybe even by 100 the amount of electricity produced by the uranium extracted from French mines?

Because you have been tricked, as you should know, when you were led to believe that the 100 traditional reactors (known as PWR pressurized water reactors) the government committed itself to build before the end of the century would be sufficient to free France from external dependence. The truth, as you are told today, is that the present nuclear program is only a first step: it would be necessary to back-up the PWR reactors with breeder reactors in order for France, instead of importing American or African uranium, to be able to depend, within 60 years, upon an entirely French energy source. Sixty years from now, at best, since it will take a minimum of 60 years; nobody denies it, for breeder reactors to take over from the present PWR's.

What should be concluded? That we must hurry, because although 60 years is a long time, there is not an instant to lose? This is the position of the CEA management, of a majority of French management at large, of a part of the management of EDF and of the government. But this position is challenged even within these groups in the name of technical as well as economic and political considerations.

First technically, large breeder reactors, including the prototype Super-Phenix, are full of unknowns more in their traditional part (particularly in the steam generator) than in their nuclear part. Common sense would demand that one see how the Super-Phenix (1200 MW capacity) will perform after its completion in 1983 before starting mass production of the Hyper-Phenix with 1500 or 1800 MW capacity.

On the other hand, from a cost standpoint a Super-Phenix type breeder reactor currently costs two or three times as much as an equivalent PWR. In the case of Super-Phenix this additional cost (about 8 billion francs) is covered by the CEA or, in other words, by the government. From the EDF standpoint, on the other hand, the commercial use of breeder reactors can only be considered if the additional cost is reduced to 25 percent, although this 25 percent is a political concession: even at this cost, it would be necessary for the cost of uranium to double for the electricity produced by the breeder reactors to become competitive with that produced by PWRs. There is no reason to believe that the cost of uranium will double; on the contrary, the construction of nuclear plants has been three times slower throughout the world than was predicted in 1972. In 10 years there will be only 350 large reactors in the world instead of the 1,100 initially anticipated. Consequently, the worldwide availability of natural and even enriched uranium will remain abundant for as long as can be predicted.

Let us nevertheless assume that this 25 percent additional cost can be justified for political reasons. Can breeder reactors be built at a price acceptable to the EDF? "Yes," replies Novatome, Super-Phenix builder, but under the following conditions: a series of six Hyper-Phenix reactors with a capacity limited to 1500 MW must be ordered; it is necessary to give up the idea of producing more plutonium than they use; and it is necessary to eliminate the containment vessel and the dome which

are intended to protect the population against the possible effects of a nuclear "excursion" (an understatement describing a low power but very polluting explosion).

On this last point, however, the decision belongs neither to the management of the EDF nor of the CEA. It is up to the Nuclear Safety Department of the CEA to determine whether it is acceptable to remove the containment vessel and dome. As it is, the Nuclear Safety Department appears reticent because although a nuclear "excursion" with partial vaporization of the core is improbable, it cannot be entirely dismissed. According to a very thorough report by the British Radiology Physics organization, such an "excursion" with the liberation of only 5 to 10 percent of the core material would have the following consequences: 100 percent instant death within a radius of 3 kilometers downwind; 60 percent at 5 kilometers; then, within several years, 16 percent of the population would die of cancer at a distance of 10 kilometers, 6 percent at 20 kilometers, 5 percent at 50 kilometers, etc.(1)

Undependable Plutonium Supplies

The general management of EDF is not eager to assume the burden of running the type of plant that will be either too expensive or too risky and which, in any case, will create tremendous problems caused by valves, vibrations, cracks and leaks at the steam generator level. The management therefore beleives that it would be preferable to wait until 1985 to make a decision on the desirability and the rate of implementation of a breeder reactor program.

This desire to "wait and see" is all the more understandable since the plutonium supply for breeder reactors is far from being assured. The 5 tons of plutonium necessary to start operation of a Super- or Hyper-Phenix do not exist in nature. It is necessary to wait for them to be produced in the core of traditional PWR reactors at the rate of 200 kilograms per reactor per year. Theoretically, the roughly 30 PWRs which will be operating in 1985 would be capable of producing sufficient plutonium to load one Hyper-Phenix per year. Provided the PWR program is pursued, it would be possible to load two Hyper-Phenix reactors starting in 1995, and then three per year starting in the next century. It is impossible to proceed faster. And even at this maximum rate, it is only toward the middle of the next century that breeder reactors will be capable of being fully independent. Until then, breeder reactors and PWRs will have to be used together, the former providing plutonium fuel for the latter.

Independently of cost problems, this beautiful program runs into a sizable unknown: will the La Hague plant really be capable of reprocessing every year 800, then 1,600, and finally 2,400 tons of spent fuel per year to extract 5, 10, and then 15 tons of plutonium per year? It is impossible to say. One sure thing, however, is that never until now has the La Hague facility (or more precisely the H.A.O. plant) been capable of operating at more than 25 percent of its theoretical capacity of 400 tons. Although French engineers can pride themselves in being the only ones in the world capable of reprocessing--and therefore of producing--plutonium on an industrial scale, it has been necessary, in order to provide the initial fuel load for the Super-Phenix, to obtain plutonium from England.

(1) An extensive analysis of this document has been published by Fabien Gruhier in SCIENCE ET AVENIR (March 1978 issue). See also "LA GAZETTE NUCLEAIRE," issue No 25.

Everyone in the know is aware that the La Hague facility is the Achilles tendon of the French nuclear program. One has only to mention this plant to cause uneasiness in the people responsible for this program. The reason is that no plutonium production plant has been capable, any more than La Hague, of operating in a continuous manner. All, whatever their size, have had serious problems which (in the United States, Great Britain, Belgium and Germany) have led to temporary or indefinite shutdowns. The last of these shutdowns involved the Karlsruhe plant (35-ton capacity) which had to be shutdown for 18 months last May for decontamination as a result of a leak in a steam condenser. The industrialization and automation of reprocessing operations have always run into practical problems caused by the form and the nature of the materials, tons of which must be treated in very small quantities while avoiding contamination of the workers by even the smallest microgram.

The cost of an 800-ton capacity reprocessing plant (three are planned) is currently estimated to be about 10 billion francs and the cost of reprocessing (and therefore of the plutonium) remains unknown. The advocates of breeder reactors always act as if reprocessing were a necessity. In reality, reprocessing and, therefore, reprocessing plants are only necessary to produce plutonium for breeder reactors. As soon as the breeder reactor program is canceled, reprocessing becomes unnecessary.(2)

Breeder reactors are, therefore, neither a miracle solution nor a ready-to-use technology: they are, first of all, an uncertain and extremely costly industrial adventure which requires an unmatched concentration of capital, power and specialized competence. When the president speaks (before and after many others) in reference to the French breeder reactors, of an energy potential comparable to the oil reserves of Saudi Arabia, he commits, says the socialist deputy Paul Quiles, an enormous swindle. An oil deposit, adds Quiles, is available and usable by anyone; plutonium energy, on the other hand, will only be available in a few decades and at the cost of giant facilities which will make a whole population dependent upon a few hundred specialists subjected to military-like discipline and surveillance.

Locking up the Future

Even within the CEA and at EDF, scientists, technicians and economists are surprised by the stubbornness of the government in backing up a technology whose merits are doubtful and the cost is exorbitant. Why pour into the plutonium effort resources which would have much faster and dependable results if they were invested in energy-saving, geothermal energy, heat networks and various solar techniques? Why, when addressing unresolved nuclear problems, is there never any doubt that "the solution will be found when the moment arrives," while "unresolved technical problems are always put forward to avoid developing techniques as easily handled and useful as solar heat, wind power, methane generators and solar batteries? Finally, why are we in such a hurry to throw France into an adventure which, beside all the risks inherent in plutonium technology, can only bear fruit in 60 years at the earliest? Do we not have every reason to believe that in 60 years, breeder reactors will be more ridiculously outdated than weapons, machines and equipment developed in 1920?

(2) On all these points, see the well documented article by Cedric Philibert in the Fall 1980 issue of the magazine SAUVAGE which just came out.

It is obvious that in this case, technical choices hide political ones. In the all-nuclear solution, the oldest and most reactionary fractions of the industrial and financial bourgeoisie are allied with an authoritarian technocracy to perpetuate their domination. For them, the objective is to lock up the future until the end of the next century. Breeder reactors are barriers to the evolution of society, industry and techniques.

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ITALY

GEOLOGISTS APPROVE MONTALTO DI CASTRO POWER PLANT

Rome ATOMO E INDUSTRIA in English 15 Oct 80 pp 8,7

[Text]

The work of the Commission of Geologists presided over by Prof. Felice Ippolito, Professor of geology at Rome University, is concluded. On 11 June last, the Commission had been charged by CNEN with the task of evaluating, on the basis of the seismotectonic analysis of the Montalto di Castro area, the validity of the project seismism prescribed by CNEN for the anti-seismic designing of the Montalto nuclear power station. Pursuing this aim, the deliberation of CNEN said, the Commission was to base its work on geological data of the technical investigation carried out by CNEN in the plant siting phase and on the study made by the Commission of geologists appointed by the Mayor of Montalto and on any other element that the Commission itself thought fit to acquire.

A first announcement of the conclusions reached, on the basis of which the resumption of work on the site of the power station should now be imminent, was made to the press in the course of a press conference held on 7 October at CNEN by the President of the Committee, Prof. Umberto Colombo and by the President of the Commission, Prof. Ippolito.

And here are the conclusions which the Commission reached in the text of the final report read to journalists by Prof. Ippolito: « *The Commission unanimously considers that in the area of the Montalto di Castro site and in the surrounding ones there does not exist any geological anomaly: that emerges both from surface observation and from the enquiries carried out by Enel and CNEN, and by stratigraphic integration studies made for this purpose by the Finalized Geodynamics Program of CNR, as well as from the data gatherad by geophysics and geochemistry during the investigation and ex novo. Furthermore there is no situation of unstable balance which might give rise in any way on the site to anomalous behaviour, whether natural or caused by man. Taking into account finally all the above-mentioned historical seismic investigations, the Commission agrees unanimously that to have attributed to the site area for project input for the plant the value of 0.18 g is correct, erring if anything on the side of prudence* ».

On the Ippolito Commission, all the geological competences necessary to evaluate the problem submitted to it by CNEN, were represented. However it integrated its own competence with that acquired, precisely with regard to the Montalto di Castro area, by the Finalized Energy Project of the National Research Council and in particular by the « neotectonics » subproject. It was precisely the geologists of the Commune of Montalto who referred to faults marked in the area of this Commune in a document of the Finalized Geodynamics Project which was of a preliminary and provisional character.

It will be useful to recall briefly at this point the terms of the matter. On 4 March the then Mayor, the Republican Alfredo Pallottl, ordered suspension of the work for the construction of the Montalto power station, on the basis of the response of a Commission of geologists appointed by the Mayor himself. According to this Commission, there are numerous active seismic faults localized in the terminal stretches of the rivers Mignone, Marta, Arrone and Fiora, which would compromise the seismic safety of the plant. The largest of these faults was said to have been detected by the geologists of the Commune along the river Mignone and it was said to be of dimensions defined as exceptional, from 20 to 50 metres. It was also said to be in full activity.

Enel had appealed against the Mayor's order to the Administrative Regional Court (TAR) of Latium, which had rejected the appeal. The Council of State, to which Enel had appealed, subsequently rectified the sentence of TAR, affirming that the measure remained valid, but only as a precautionary one, that is, until the competent organs (CNEN) had ascertained the real entity of the anomalies pointed out by the Mayor. With the conclusion of the work of the Ippolito Commission and with the presentation of its results to the Ministry of Industry, which is considered imminent, this juridical affair, which, blocking for another eight months the work of the power station, has caused Enel and the country a further loss of hundreds of billions of lire is, therefore, concluded.

This juridical battle has also had numerous collateral episodes such

as the attempts of the Montalto Commune Bar to invalidate the legitimacy of the Ippolito Commission, accusing its President and Prof. Martinis of having carried out consultation activities in favour of Enel, an action evidently incompatible with their capacity as super-experts. Prof. Ippolito answered this accusation amply, showing its groundlessness, with a denial issued to press agencies, and with a detailed exposition made in public on the occasion of the first public presentation of the results of the Commission, which took place on 10 October in the Provincial Administration Hall of Viterbo in the presence of the Committee and Provincial Council and a numerous public.

At the Viterbo meeting there was also an intervention of the new Mayor of Montalto di Castro, the Communist Francesco Serafinelli, from which it is possible to deduce, albeit with emphasis on request for information and guarantees concerning the safety of the plant, a turning point in the attitude of the Town Council of Montalto di Castro towards the power station.

Among the public in the hall of the Provincial Council, there were present representatives of the various antinuclear initiatives such as Friends of the Earth and the Committee for the Control of Energy Choices, as well as of associations such as ARCI which support antinuclear action. From their interventions it was deduced that their battle against the power station will have an essentially juridico-legal character in the future. The denunciation presented to the Magistrate Gianfranco Amendola by the antinuclear Committee of citizens of Montalto di Castro with regard to CNEN and to the Ippolito Commission for omission of official duties, falls, in fact, into this schema. The Magistrate Amendola sent judiciary communications to the President of CNEN and to the President of the Technical Commission for Safety, Prof. Giulio Battistini, communications which have been transformed into « incriminations », in the communiqués of the antinuclears.

In a declaration issued at the end of the Viterbo meeting, Prof. Ippolito affirmed that he did not consider alternative energies « substantial » for the solution of Italian energy problems. « *The ways to take*, he added, *are the nuclear one and the coal one. Both present delicate aspects, the former in the construction phase, the latter because of pollution problems. The nuclear source is indispensable, but I am contrary to a completely nuclear or completely coal way just as in the past I was contrary to the completely oil way* ».

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PORTUGAL

BRIEFS

ENERGY DIVERSIFICATION INVESTMENT PROGRAM--Portuguese Minister of Industry Alvaro Barreto said that his country will invest $40 billion between now and the end of the century to diversify its energy supplies. Particular effort will be dedicated to the nuclear area, which will also benefit from this program. In any event, Portugal has proven uranium reserves in excess of 10,000 tons which could be easily doubled or even increased ten-fold if an extensive exploration program is put into effect. [Text] [Paris DEFENSE ET DIPLOMATIE in French 17 Nov 80 p 2]

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